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SEQUENCE LISTING

<110> Lockridge, Oksana
Watkins, Jeffry D.

<120> Butyrylcholinesterase Variants and
Methods of Use

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TO THE "GATEWAY"

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Phe Ile Cys Pro Ala Leu Glu Phe Thr Lys Lys Phe Ser Glu Trp Gly	
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109430-030101

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Gly	Leu	Lys	Ile	Phe	Phe	Pro	Gly	Val	Ser	Glu	Phe	Gly	Lys	Glu	Ser
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Pro	Ala	Leu	Glu	Phe	Thr	Lys	Lys	Phe	Ser	Glu	Trp	Gly	Asn	Asn	Ala
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Phe	Phe	Tyr	Tyr	Phe	Glu	His	Arg	Ser	Ser	Lys	Leu	Pro	Trp	Pro	Glu
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Trp	Met	Gly	Val	Met	His	Gly	Tyr	Glu	Ile	Glu	Phe	Val	Phe	Gly	Leu
	435					440						445			
Pro	Leu	Glu	Arg	Arg	Asp	Asn	Tyr	Thr	Lys	Ala	Glu	Glu	Ile	Leu	Ser
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Asn	Glu	Thr	Gln	Asn	Asn	Ser	Thr	Ser	Trp	Pro	Val	Phe	Lys	Ser	Thr
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Glu	Gln	Lys	Tyr	Leu	Thr	Leu	Asn	Thr	Glu	Ser	Thr	Arg	Ile	Met	Thr
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Val	Leu	Glu	Met	Thr	Gly	Asn	Ile	Asp	Glu	Ala	Glu	Trp	Glu	Trp	Lys
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Phe	Asn	Asp	Tyr	Thr	Ser	Lys	Lys	Glu	Ser	Cys	Val	Gly	Leu		
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Gly	Phe	Leu	Ala	Leu	Pro	Gly	Asn	Pro	Glu	Ala	Pro	Gly	Asn	Met	Gly	
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Leu	Phe	Asp	Gln	Gln	Leu	Ala	Leu	Gln	Trp	Val	Gln	Lys	Asn	Ile	Ala	
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gcc	ttt	ggt	gga	aat	cct	aaa	agt	gta	act	ctc	ttt	gga	gaa	agt	gca	810
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gga	gca	gct	tca	gtt	agc	ctg	cat	ttg	ctt	tct	cct	gga	agc	cat	tca	858
Gly	Ala	Ala	Ser	Val	Ser	Leu	His	Leu	Leu	Ser	Pro	Gly	Ser	His	Ser	
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Leu	Phe	Thr	Arg	Ala	Ile	Leu	Gln	Ser	Gly	Ser	Phe	Asn	Ala	Pro	Trp	
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gcg	gta	aca	tct	ctt	tat	gaa	gct	agg	aac	aga	acg	ttg	aac	tta	gct	954
Ala	Val	Thr	Ser	Leu	Tyr	Glu	Ala	Arg	Asn	Arg	Thr	Leu	Asn	Leu	Ala	
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Lys	Leu	Thr	Gly	Cys	Ser	Arg	Glu	Asn	Glu	Thr	Glu	Ile	Ile	Lys	Cys	
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Leu	Arg	Asn	Lys	Asp	Pro	Gln	Glu	Ile	Leu	Leu	Asn	Glu	Ala	Phe	Val	
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gtc	ccc	tat	ggg	act	cag	ttg	tca	gta	aac	ttt	ggt	ccg	acc	gtg	gat	1098
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Gly	Asp	Phe	Leu	Thr	Asp	Met	Pro	Asp	Ile	Leu	Leu	Glu	Leu	Gly	Gln	
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Phe	Lys	Lys	Thr	Gln	Ile	Leu	Val	Gly	Val	Asn	Lys	Asp	Glu	Gly	Thr	
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gct	ttt	tta	gtc	tat	ggt	gct	cct	ggc	ttc	agc	aaa	gat	aac	aat	agt	1242
Ala	Phe	Leu	Val	Tyr	Gly	Ala	Pro	Gly	Phe	Ser	Lys	Asp	Asn	Asn	Ser	
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Ile	Ile	Thr	Arg	Lys	Glu	Phe	Gln	Glu	Gly</							

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Gly Val Ser Glu Phe Gly Lys Glu Ser Ile Leu Phe His Tyr Thr Asp			
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tgg gta gat gat cag aga cct gaa aac tac cgt gag gcc ttg ggt gat			1386
Trp Val Asp Asp Gln Arg Pro Glu Asn Tyr Arg Glu Ala Leu Gly Asp			
	380	385	390
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Val Val Gly Asp Tyr Asn Phe Ile Cys Pro Ala Leu Glu Phe Thr Lys			
	395	400	405
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Lys Phe Ser Glu Trp Gly Asn Asn Ala Phe Phe Tyr Tyr Phe Glu His			
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cga tcc tcc aaa ctt ccg tgg cca gaa tgg atg gga gtg atg cat ggc			1530
Arg Ser Ser Lys Leu Pro Trp Pro Glu Trp Met Gly Val Met His Gly			
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Tyr Glu Ile Glu Phe Val Phe Gly Leu Pro Leu Glu Arg Arg Asp Asn			
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Tyr Thr Lys Ala Glu Glu Ile Leu Ser Arg Ser Ile Val Lys Arg Trp			
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Ala Asn Phe Ala Lys Tyr Gly Asn Pro Asn Glu Thr Gln Asn Asn Ser			
	475	480	485
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Thr Ser Trp Pro Val Phe Lys Ser Thr Glu Gln Lys Tyr Leu Thr Leu			
	490	495	500
aat aca gag tca aca aga ata atg acg aaa cta cgt gct caa caa tgt			1770
Asn Thr Glu Ser Thr Arg Ile Met Thr Lys Leu Arg Ala Gln Gln Cys			
	505	510	515
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Arg Phe Trp Thr Ser Phe Phe Pro Lys Val Leu Glu Met Thr Gly Asn			
520	525	530	535
att gat gaa gca gaa tgg gag tgg aaa gca gga ttc cat cgc tgg aac			1866
Ile Asp Glu Ala Glu Trp Glu Trp Lys Ala Gly Phe His Arg Trp Asn			
	540	545	550
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<210> 6
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<220>
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Tyr	Ala	Gln 35	Pro	Pro	Leu	Gly	Arg 40	Leu	Arg	Phe	Lys	Lys 45	Pro	Gln	Ser
Leu	Thr 50	Lys	Trp	Ser	Asp	Ile 55	Trp	Asn	Ala	Thr	Lys 60	Tyr	Ala	Asn	Ser
Cys 65	Cys	Gln	Asn	Ile	Asp 70	Gln	Ser	Phe	Pro	Gly 75	Phe	His	Gly	Ser 80	Glu
Met	Trp	Asn	Pro	Asn 85	Thr	Asp	Leu	Ser	Glu 90	Asp	Cys	Leu	Tyr	Leu 95	Asn
Val	Trp	Ile	Pro 100	Ala	Pro	Lys	Pro	Lys 105	Asn	Ala	Thr	Val	Leu 110	Ile	Trp
Ile	Tyr	Gly 115	Gly	Gly	Phe	Gln	Thr 120	Gly	Thr	Ser	Ser	Leu 125	His	Val	Tyr
Asp	Gly 130	Lys	Phe	Leu	Ala	Arg 135	Val	Glu	Arg	Val 140	Ile	Val	Val	Ser	Met
Asn 145	Tyr	Arg	Val	Gly	Ala 150	Leu	Gly	Phe	Leu	Ala 155	Leu	Pro	Gly	Asn 160	Pro
Glu	Ala	Pro	Gly	Asn 165	Met	Gly	Leu	Phe	Asp 170	Gln	Gln	Leu	Ala 175	Leu	Gln
Trp	Val	Gln	Lys 180	Asn	Ile	Ala	Ala 185	Phe	Gly	Gly	Asn	Pro	Lys 190	Ser	Val
Thr	Leu	Phe 195	Gly	Glu	Ser	Ala	Gly 200	Ala	Ala	Ser	Val	Ser 205	Leu	His	Leu
Leu	Ser 210	Pro	Gly	Ser	His	Ser 215	Leu	Phe	Thr	Arg	Ala 220	Ile	Leu	Gln	Ser
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<220>
<223> Human Butyrylcholinesterase variant

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 170 175 180

gcc ttt ggt gga aat cct aaa agt gta act ctc ttt gga gaa agt gca	810
Ala Phe Gly Gly Asn Pro Lys Ser Val Thr Leu Phe Gly Glu Ser Ala	
185 190 195	
gga gca gct tca gtt agc ctg cat ttg ctt tct cct gga agc cat tca	858
Gly Ala Ala Ser Val Ser Leu His Leu Leu Ser Pro Gly Ser His Ser	
200 205 210 215	
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Leu Phe Thr Arg Ala Ile Leu Gln Ser Gly Ser Phe Asn Ala Pro Trp	
220 225 230	
gcg gta aca tct ctt tat gaa gct agg aac aga acg ttg aac tta gct	954
Ala Val Thr Ser Leu Tyr Glu Ala Arg Asn Arg Thr Leu Asn Leu Ala	
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Lys Leu Thr Gly Cys Ser Arg Glu Asn Glu Thr Glu Ile Ile Lys Cys	
250 255 260	
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Leu Arg Asn Lys Asp Pro Gln Glu Ile Leu Leu Asn Glu Ala Phe Val	
265 270 275	
gtc ccc tat ggg act tcg ttg tca gta aac ttt ggt ccg acc gtg gat	1098
Val Pro Tyr Gly Thr Ser Leu Ser Val Asn Phe Gly Pro Thr Val Asp	
280 285 290 295	
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Gly Asp Phe Leu Thr Asp Met Pro Asp Ile Leu Leu Glu Leu Gly Gln	
300 305 310	
ttt aaa aaa acc cag att ttg gtg ggt gtt aat aaa gat gaa ggg aca	1194
Phe Lys Lys Thr Gln Ile Leu Val Gly Val Asn Lys Asp Glu Gly Thr	
315 320 325	
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330 335 340	
atc ata act aga aaa gaa ttt cag gaa ggt tta aaa ata ttt ttt cca	1290
Ile Ile Thr Arg Lys Glu Phe Gln Glu Gly Leu Lys Ile Phe Phe Pro	
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gga gtg agt gag ttt gga aag gaa tcc atc ctt ttt cat tac aca gac	1338
Gly Val Ser Glu Phe Gly Lys Glu Ser Ile Leu Phe His Tyr Thr Asp	
360 365 370 375	
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380 385 390	

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460 465 470	
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475 480 485	
aca agc tgg cct gtc ttc aaa agc act gaa caa aaa tat cta acc ttg	1722
Thr Ser Trp Pro Val Phe Lys Ser Thr Glu Gln Lys Tyr Leu Thr Leu	
490 495 500	
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520 525 530 535	
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540 545 550	
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555 560 565	
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Lys Glu Ser Cys Val Gly Leu	
570	

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Tyr	Ala	Gln	Pro	Pro	Leu	Gly	Arg 40	Leu	Arg	Phe	Lys	Lys 45	Pro	Gln	Ser
Leu	Thr 50	Lys	Trp	Ser	Asp	Ile 55	Trp	Asn	Ala	Thr	Lys 60	Tyr	Ala	Asn	Ser
Cys 65	Cys	Gln	Asn	Ile	Asp 70	Gln	Ser	Phe	Pro	Gly 75	Phe	His	Gly	Ser 80	Glu
Met	Trp	Asn	Pro	Asn 85	Thr	Asp	Leu	Ser	Glu 90	Asp	Cys	Leu	Tyr	Leu 95	Asn
Val	Trp	Ile	Pro	Ala	Pro	Lys	Pro	Lys 105	Asn	Ala	Thr	Val	Leu	Ile 110	Trp
Ile	Tyr	Gly 115	Gly	Gly	Phe	Gln	Thr 120	Gly	Thr	Ser	Ser	Leu	His	Val 125	Tyr
Asp	Gly 130	Lys	Phe	Leu	Ala	Arg	Val 135	Glu	Arg	Val	Ile	Val	Val	Ser 140	Met
Asn 145	Tyr	Arg	Val	Gly	Ala	Leu	Gly	Phe	Leu	Ala	Leu	Pro	Gly	Asn 160	Pro
Glu	Ala	Pro	Gly	Asn 165	Met	Gly	Leu	Phe	Asp	Gln	Gln	Leu	Ala	Leu 175	Gln
Trp	Val	Gln	Lys 180	Asn	Ile	Ala	Ala	Phe	Gly 185	Gly	Asn	Pro	Lys	Ser 190	Val
Thr	Leu	Phe 195	Gly	Glu	Ser	Ala	Gly	Ala	Ala	Ser	Val	Ser	Leu	His 205	Leu
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Gly 225	Ser	Phe	Asn	Ala	Pro	Trp	Ala	Val	Thr	Ser	Leu	Tyr	Glu	Ala 240	Arg
Asn	Arg	Thr	Leu	Asn 245	Leu	Ala	Lys	Leu	Thr	Gly	Cys	Ser	Arg	Glu 255	Asn
Glu	Thr	Glu	Ile 260	Lys	Cys	Leu	Arg	Asn	Lys	Asp	Pro	Gln	Glu	Ile 270	
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Asn	Phe 290	Gly	Pro	Thr	Val	Asp	Gly	Asp	Phe	Leu	Thr	Asp	Met	Pro	Asp
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Phe	Ser	Lys	Asp	Asn	Asn	Ser	Ile	Ile	Thr	Arg	Lys	Glu	Phe	Gln	Glu
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Gly	Leu	Lys	Ile	Phe	Phe	Pro	Gly	Val	Ser	Glu	Phe	Gly	Lys	Glu	Ser
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Ile	Leu	Phe	His	Tyr	Thr	Asp	Trp	Val	Asp	Asp	Gln	Arg	Pro	Glu	Asn
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Tyr	Arg	Glu	Ala	Leu	Gly	Asp	Val	Val	Gly	Asp	Tyr	Asn	Phe	Ile	Cys
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Pro	Ala	Leu	Glu	Phe	Thr	Lys	Lys	Phe	Ser	Glu	Trp	Gly	Asn	Asn	Ala
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Phe	Phe	Tyr	Tyr	Phe	Glu	His	Arg	Ser	Ser	Lys	Leu	Pro	Trp	Pro	Glu
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Trp	Met	Gly	Val	Met	His	Gly	Tyr	Glu	Ile	Glu	Phe	Val	Phe	Gly	Leu
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Pro	Leu	Glu	Arg	Arg	Asp	Asn	Tyr	Thr	Lys	Ala	Glu	Glu	Ile	Leu	Ser
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Arg	Ser	Ile	Val	Lys	Arg	Trp	Ala	Asn	Phe	Ala	Lys	Tyr	Gly	Asn	Pro
465					470					475					480
Asn	Glu	Thr	Gln	Asn	Asn	Ser	Thr	Ser	Trp	Pro	Val	Phe	Lys	Ser	Thr
				485					490					495	
Glu	Gln	Lys	Tyr	Leu	Thr	Leu	Asn	Thr	Glu	Ser	Thr	Arg	Ile	Met	Thr
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Lys	Leu	Arg	Ala	Gln	Gln	Cys	Arg	Phe	Trp	Thr	Ser	Phe	Phe	Pro	Lys
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Val	Leu	Glu	Met	Thr	Gly	Asn	Ile	Asp	Glu	Ala	Glu	Trp	Glu	Trp	Lys
	530					535					540				
Ala	Gly	Phe	His	Arg	Trp	Asn	Asn	Tyr	Met	Met	Asp	Trp	Lys	Asn	Gln
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<212> PRT

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<223> Human Butyrylcholinesterase variant

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<212> PRT

<213> Artificial Sequence

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<223> Human Butyrylcholinesterase variant

<400> 12

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<223> Human Butyrylcholinesterase variant

<400> 13

Ala Phe Val Val Pro Tyr Gly Thr Pro Leu Ser Val Asn
1 5 10

<210> 14

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Human Butyrylcholinesterase variant

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<400> 16						
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ccgaagtatt	acatgatttt	cactccttgc	aaactttacc	atctttgttg	cagagaatcg	120
gaaatcaata	tgcatagcaa	agtcacaatc	atatgcatac	gattttctct	ttggtttctt	180
ttgctctgca	tgttatttgg	gaagtcacat	actgaagatg	acatcataat	tgcaacaaag	240
aatggaaaag	tcagagggat	gaacttgaca	gtttttggtg	gcacggtaac	agcctttctt	300
ggaattccct	atgcacagcc	acctcttgg	agacttcgat	tcaaaaagcc	acagtctctg	360
accaagtgg	ctgatatttg	gaatgccaca	aaatatgcaa	attcttgctg	tcagaacata	420
gatcaaagtt	ttccaggctt	ccatggatca	gagatgtgga	acccaaacac	tgacctcagt	480
gaagactgtt	tatatctaaa	tgtatggatt	ccagcaccta	aacccaaaaa	tgccactgta	540
ttgatatgga	tttatggtgg	tggttttcaa	actggaacat	catctttaca	tgtttatgat	600
ggcaagtttc	tggctcgggt	tgaaagagtt	attgtagtgt	caatgaacta	taggggtgggt	660
gccctaggat	tcttagcttt	gccaggaaat	cctgaggctc	cagggaacat	gggtttattt	720
gatcaacagt	tggctcttca	gtgggttcaa	aaaaatatag	cagcctttgg	tggaatcctt	780
aaaagtgtaa	ctctcttttg	agaaagtgca	ggagcagctt	cagttagcct	gcatttgctt	840
tctcttgtaa	gccattcatt	gttcaccaga	gccattctgc	aaagtggatc	ctttaatgct	900
ccttgggcgg	taacatctct	ttatgaagct	aggaacagaa	cgttgaactt	agctaaattg	960
actggttgct	ctagagagaa	tgagactgaa	ataatcaagt	gtcttagaaa	taaagatccc	1020
caagaaattc	ttctgaatga	agcatttggt	gtcccttatg	ggactccttt	gtcagtaaac	1080
tttgggtccg	ccgtggatgg	tgattttctc	actgacatgc	cagacatatt	acttgaactt	1140
ggacaattta	aaaaaaccca	gattttggtg	ggtgttaata	aagatgaagg	gacagctttt	1200
ttagtctatg	gtgctcctgg	cttcagcaaa	gataacaata	gtatcataac	tagaaaagaa	1260
tttcaggaag	gtttaaaaat	attttttcca	ggagtgaagt	agtttgaaa	ggaatccatc	1320
ctttttcatt	acacagactg	ggtagatgat	cagagacctg	aaaactaccg	tgaggccttg	1380
ggtgatgttg	ttggggatta	taatttcata	tgccctgcct	tggagttcac	caagaagttc	1440
tcagaatggg	gaaataatgc	ctttttctac	tattttgaac	accgatcctc	caaacttccg	1500
tggccagaat	ggatggggagt	gatgcattgg	tatgaaattg	aattttgtct	tggtttacct	1560
ctggaaagaa	gagataatta	cacaaaagcc	gaggaaattt	tgagtagatc	catagtgaaa	1620
cgggtgggcaa	atttttqcaa	atatgggaat	ccaaatgaga	ctcagaacaa	tagcacaagc	1680

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<210> 17
<211> 574
<212> PRT
<213> Homo sapiens
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<400> 17															
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Asn	Leu	Thr	Val 20	Phe	Gly	Gly	Thr	Val 25	Thr	Ala	Phe	Leu	Gly 30	Ile	Pro
Tyr	Ala	Gln 35	Pro	Pro	Leu	Gly	Arg 40	Leu	Arg	Phe	Lys	Lys 45	Pro	Gln	Ser
Leu	Thr 50	Lys	Trp	Ser	Asp	Ile 55	Trp	Asn	Ala	Thr	Lys 60	Tyr	Ala	Asn	Ser
Cys 65	Cys	Gln	Asn	Ile	Asp 70	Gln	Ser	Phe	Pro	Gly 75	Phe	His	Gly	Ser 80	Glu
Met	Trp	Asn	Pro	Asn 85	Thr	Asp	Leu	Ser	Glu 90	Asp	Cys	Leu	Tyr	Leu 95	Asn
Val	Trp	Ile	Pro 100	Ala	Pro	Lys	Pro	Lys 105	Asn	Ala	Thr	Val	Leu 110	Ile	Trp
Ile	Tyr	Gly 115	Gly	Gly	Phe	Gln	Thr 120	Gly	Thr	Ser	Ser	Leu 125	His	Val	Tyr
Asp	Gly 130	Lys	Phe	Leu	Ala	Arg 135	Val	Glu	Arg	Val	Ile 140	Val	Val	Ser	Met
Asn 145	Tyr	Arg	Val	Gly	Ala 150	Leu	Gly	Phe	Leu	Ala 155	Leu	Pro	Gly	Asn 160	Pro
Glu	Ala	Pro	Gly	Asn 165	Met	Gly	Leu	Phe	Asp 170	Gln	Gln	Leu	Ala 175	Leu	Gln
Trp	Val	Gln 180	Lys	Asn	Ile	Ala	Ala 185	Phe	Gly	Gly	Asn	Pro	Lys 190	Ser	Val
Thr	Leu	Phe 195	Gly	Glu	Ser	Ala	Gly 200	Ala	Ala	Ser	Val	Ser 205	Leu	His	Leu
Leu	Ser 210	Pro	Gly	Ser	His	Ser 215	Leu	Phe	Thr	Arg	Ala 220	Ile	Leu	Gln	Ser
Gly 225	Ser	Phe	Asn	Ala	Pro 230	Trp	Ala	Val	Thr	Ser 235	Leu	Tyr	Glu	Ala 240	Arg
Asn	Arg	Thr	Leu	Asn 245	Leu	Ala	Lys	Leu	Thr 250	Gly	Cys	Ser	Arg	Glu 255	Asn
Glu	Thr	Glu	Ile	Ile	Lys	Cys	Leu	Arg	Asn	Lys	Asp	Pro	Gln	Glu	Ile

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<210> 18
<211> 574
<212> PRT
<213> Homo sapiens
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<400> 18
Glu Asp Asp Ile Ile Ile Ala Thr Lys Asn Gly Lys Val Arg Gly Met
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Asn Leu Thr Val Phe Gly Gly Thr Val Thr Ala Phe Leu Gly Ile Pro
20 25 30
Tyr Ala Gln Pro Pro Leu Gly Arg Leu Arg Phe Lys Lys Pro Gln Ser
35 40 45

Leu	Thr	Lys	Trp	Ser	Asp	Ile	Trp	Asn	Ala	Thr	Lys	Tyr	Ala	Asn	Ser
50						55					60				
Cys	Cys	Gln	Asn	Ile	Gly	Gln	Ser	Phe	Pro	Gly	Phe	His	Gly	Ser	Glu
65					70					75					80
Met	Trp	Asn	Pro	Asn	Thr	Asp	Leu	Ser	Glu	Asp	Cys	Leu	Tyr	Leu	Asn
				85					90					95	
Val	Trp	Ile	Pro	Ala	Pro	Lys	Pro	Lys	Asn	Ala	Thr	Val	Leu	Ile	Trp
			100						105				110		
Ile	Tyr	Gly	Gly	Gly	Phe	Gln	Thr	Gly	Thr	Ser	Ser	Leu	His	Val	Tyr
	115						120					125			
Asp	Gly	Lys	Phe	Leu	Ala	Arg	Val	Glu	Arg	Val	Ile	Val	Val	Ser	Met
	130					135					140				
Asn	Tyr	Arg	Val	Gly	Ala	Leu	Gly	Phe	Leu	Ala	Leu	Pro	Gly	Asn	Pro
145					150					155					160
Glu	Ala	Pro	Gly	Asn	Met	Gly	Leu	Phe	Asp	Gln	Gln	Leu	Ala	Leu	Gln
				165					170					175	
Trp	Val	Gln	Lys	Asn	Ile	Ala	Ala	Phe	Gly	Gly	Asn	Pro	Lys	Ser	Val
			180					185					190		
Thr	Leu	Phe	Gly	Glu	Ser	Ala	Gly	Ala	Ala	Ser	Val	Ser	Leu	His	Leu
	195						200					205			
Leu	Ser	Pro	Gly	Ser	His	Ser	Leu	Phe	Thr	Arg	Ala	Ile	Leu	Gln	Ser
	210					215					220				
Gly	Ser	Phe	Asn	Ala	Pro	Trp	Ala	Val	Thr	Ser	Leu	Tyr	Glu	Ala	Arg
225					230					235					240
Asn	Arg	Thr	Leu	Asn	Leu	Ala	Lys	Leu	Thr	Gly	Cys	Ser	Arg	Glu	Asn
				245					250					255	
Glu	Thr	Glu	Ile	Ile	Lys	Cys	Leu	Arg	Asn	Lys	Asp	Pro	Gln	Glu	Ile
			260					265					270		
Leu	Leu	Asn	Glu	Ala	Phe	Val	Val	Pro	Tyr	Gly	Thr	Pro	Leu	Ser	Val
	275						280					285			
Asn	Phe	Gly	Pro	Thr	Val	Asp	Gly	Asp	Phe	Leu	Thr	Asp	Met	Pro	Asp
	290					295					300				
Ile	Leu	Leu	Glu	Leu	Gly	Gln	Phe	Lys	Lys	Thr	Gln	Ile	Leu	Val	Gly
305					310					315					320
Val	Asn	Lys	Asp	Glu	Gly	Thr	Ala	Phe	Leu	Val	Tyr	Gly	Ala	Pro	Gly
				325					330					335	
Phe	Ser	Lys	Asp	Asn	Asn	Ser	Ile	Ile	Thr	Arg	Lys	Glu	Phe	Gln	Glu
			340					345					350		
Gly	Leu	Lys	Ile	Phe	Phe	Pro	Gly	Val	Ser	Glu	Phe	Gly	Lys	Glu	Ser
	355						360				365				
Ile	Leu	Phe	His	Tyr	Thr	Asp	Trp	Val	Asp	Asp	Gln	Arg	Pro	Glu	Asn
	370					375					380				
Tyr	Arg	Glu	Ala	Leu	Gly	Asp	Val	Val	Gly	Asp	Tyr	Asn	Phe	Ile	Cys
385					390					395					400
Pro	Ala	Leu	Glu	Phe	Thr	Lys	Lys	Phe	Ser	Glu	Trp	Gly	Asn	Asn	Ala
				405					410					415	
Phe	Phe	Tyr	Tyr	Phe	Glu	His	Arg	Ser	Ser	Lys	Leu	Pro	Trp	Pro	Glu
			420					425					430		
Trp	Met	Gly	Val	Met	His	Gly	Tyr	Glu	Ile	Glu	Phe	Val	Phe	Gly	Leu
	435						440					445			
Pro	Leu	Glu	Arg	Arg	Asp	Asn	Tyr	Thr	Lys	Ala	Glu	Glu	Ile	Leu	Ser
	450					455					460				
Arg	Ser	Ile	Val	Lys	Arg	Trp	Ala	Asn	Phe	Ala	Lys	Tyr	Gly	Asn	Pro

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465					470					475				480
Asn	Glu	Thr	Gln	Asn	Asn	Ser	Thr	Ser	Trp	Pro	Val	Phe	Lys	Ser Thr
				485					490					495
Glu	Gln	Lys	Tyr	Leu	Thr	Leu	Asn	Thr	Glu	Ser	Thr	Arg	Ile	Met Thr
			500					505					510	
Lys	Leu	Arg	Ala	Gln	Gln	Cys	Arg	Phe	Trp	Thr	Ser	Phe	Phe	Pro Lys
		515					520					525		
Val	Leu	Glu	Met	Thr	Gly	Asn	Ile	Asp	Glu	Ala	Glu	Trp	Glu	Trp Lys
	530					535					540			
Ala	Gly	Phe	His	Arg	Trp	Asn	Asn	Tyr	Met	Met	Asp	Trp	Lys	Asn Gln
545					550					555				560
Phe	Asn	Asp	Tyr	Thr	Ser	Lys	Lys	Glu	Ser	Cys	Val	Gly	Leu	
				565					570					

<210> 19
 <211> 574
 <212> PRT
 <213> Homo sapiens

<400> 19														
Glu	Asp	Asp	Ile	Ile	Ile	Ala	Thr	Lys	Asn	Gly	Lys	Val	Arg	Gly Met
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Asn	Leu	Thr	Val	Phe	Gly	Gly	Thr	Val	Thr	Ala	Phe	Leu	Gly	Ile Pro
			20					25					30	
Tyr	Ala	Gln	Pro	Pro	Leu	Gly	Arg	Leu	Arg	Phe	Lys	Lys	Pro	Gln Ser
		35					40					45		
Leu	Thr	Lys	Trp	Ser	Asp	Ile	Trp	Asn	Ala	Thr	Lys	Tyr	Ala	Asn Ser
	50					55					60			
Cys	Cys	Gln	Asn	Ile	Asp	Gln	Ser	Phe	Pro	Gly	Phe	His	Gly	Ser Glu
65				70						75				80
Met	Trp	Asn	Pro	Asn	Thr	Asp	Leu	Ser	Glu	Asp	Cys	Leu	Tyr	Leu Asn
			85						90					95
Val	Trp	Ile	Pro	Ala	Pro	Lys	Pro	Lys	Asn	Ala	Thr	Val	Leu	Ile Trp
			100					105					110	
Ile	Tyr	Gly	Gly	Gly	Phe	Gln	Thr	Gly	Thr	Ser	Ser	Leu	His	Val Tyr
		115					120					125		
Asp	Gly	Lys	Phe	Leu	Ala	Arg	Val	Glu	Arg	Val	Ile	Val	Val	Ser Met
	130					135					140			
Asn	Tyr	Arg	Val	Gly	Ala	Leu	Gly	Phe	Leu	Ala	Leu	Pro	Gly	Asn Pro
145				150						155				160
Glu	Ala	Pro	Gly	Asn	Met	Gly	Leu	Phe	Asp	Gln	Gln	Leu	Ala	Leu Gln
			165						170					175
Trp	Val	Gln	Lys	Asn	Ile	Ala	Ala	Phe	Gly	Gly	Asn	Pro	Lys	Ser Val
			180					185					190	
Thr	Leu	Phe	Gly	Glu	Ser	Ala	Gly	Ala	Ala	Ser	Val	Ser	Leu	His Leu
		195					200					205		
Leu	Ser	Pro	Gly	Ser	His	Ser	Leu	Phe	Thr	Arg	Ala	Ile	Leu	Gln Ser
	210					215					220			
Gly	Ser	Phe	Asn	Ala	Pro	Trp	Ala	Val	Thr	Ser	Leu	Tyr	Glu	Ala Arg
225				230						235				240
Asn	Arg	Thr	Leu	Asn	Leu	Ala	Lys	Leu	Thr	Gly	Cys	Ser	Arg	Glu Asn
				245					250					255

09744739 "060101"

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<210> 20
<211> 574
<212> PRT
<213> Homo sapiens
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<400> 20
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1 5 10 15
Asn Leu Thr Val Phe Gly Gly Thr Val Thr Ala Phe Leu Gly Ile Pro
20 25 30
Tyr Ala Gln Pro Pro Leu Gly Arg Leu Arg Phe Lys Lys Pro Gln Ser

		35					40					45				
Leu	Thr	Lys	Trp	Ser	Asp	Ile	Trp	Asn	Ala	Thr	Lys	Tyr	Ala	Asn	Ser	
	50					55					60					
Cys	Cys	Gln	Asn	Ile	Asp	Gln	Ser	Phe	Pro	Gly	Phe	His	Gly	Ser	Glu	
65					70					75					80	
Met	Trp	Asn	Pro	Asn	Thr	Asp	Leu	Ser	Glu	Asp	Cys	Leu	Tyr	Leu	Asn	
				85					90					95		
Val	Trp	Ile	Pro	Ala	Pro	Lys	Pro	Lys	Asn	Ala	Thr	Val	Leu	Ile	Trp	
			100						105				110			
Ile	Tyr	Gly	Gly	Gly	Phe	Gln	Thr	Gly	Thr	Ser	Ser	Leu	His	Val	Tyr	
		115					120					125				
Asp	Gly	Lys	Phe	Leu	Ala	Arg	Val	Glu	Arg	Val	Ile	Val	Val	Ser	Met	
	130					135					140					
Asn	Tyr	Arg	Val	Gly	Ala	Leu	Gly	Phe	Leu	Ala	Leu	Pro	Gly	Asn	Pro	
145					150					155					160	
Glu	Ala	Pro	Gly	Asn	Met	Gly	Leu	Phe	Asp	Gln	Gln	Leu	Ala	Leu	Gln	
				165					170					175		
Trp	Val	Gln	Lys	Asn	Ile	Ala	Ala	Phe	Gly	Gly	Asn	Pro	Lys	Ser	Val	
			180					185					190			
Thr	Leu	Phe	Gly	Glu	Ser	Ala	Gly	Ala	Ala	Ser	Val	Ser	Leu	His	Leu	
		195					200					205				
Leu	Ser	Pro	Gly	Ser	His	Ser	Leu	Phe	Thr	Arg	Ala	Ile	Leu	Gln	Ser	
	210					215					220					
Gly	Ser	Phe	Asn	Ala	Pro	Trp	Ala	Val	Thr	Ser	Leu	Tyr	Glu	Ala	Arg	
225					230					235					240	
Asn	Arg	Thr	Leu	Asn	Leu	Ala	Lys	Leu	Thr	Gly	Cys	Ser	Arg	Glu	Asn	
				245					250					255		
Glu	Thr	Glu	Ile	Ile	Lys	Cys	Leu	Arg	Asn	Lys	Asp	Pro	Gln	Glu	Ile	
			260					265					270			
Leu	Leu	Asn	Glu	Ala	Phe	Val	Val	Pro	Tyr	Gly	Thr	Pro	Leu	Ser	Val	
		275					280					285				
Asn	Phe	Gly	Pro	Thr	Val	Asp	Gly	Asp	Phe	Leu	Thr	Asp	Met	Pro	Asp	
	290					295					300					
Ile	Leu	Leu	Glu	Leu	Gly	Gln	Phe	Lys	Lys	Thr	Gln	Ile	Leu	Val	Gly	
305					310					315					320	
Val	Asn	Lys	Asp	Glu	Gly	Thr	Ala	Phe	Leu	Val	Tyr	Gly	Ala	Pro	Gly	
				325					330					335		
Phe	Ser	Lys	Asp	Asn	Asn	Ser	Ile	Ile	Thr	Arg	Lys	Glu	Phe	Gln	Glu	
			340					345					350			
Gly	Leu	Lys	Ile	Phe	Phe	Pro	Gly	Val	Ser	Glu	Phe	Gly	Lys	Glu	Ser	
		355					360					365				
Ile	Leu	Phe	His	Tyr	Thr	Asp	Trp	Val	Asp	Asp	Gln	Arg	Pro	Glu	Asn	
	370					375					380					
Tyr	Arg	Glu	Ala	Leu	Gly	Asp	Val	Val	Gly	Asp	Tyr	Asn	Phe	Ile	Cys	
385					390					395						

Arg	Ser	Ile	Val	Lys	Arg	Trp	Ala	Asn	Phe	Ala	Lys	Tyr	Gly	Asn	Pro
465					470					475					480
Asn	Glu	Thr	Gln	Asn	Asn	Ser	Thr	Ser	Trp	Pro	Val	Phe	Lys	Ser	Thr
				485					490					495	
Glu	Gln	Lys	Tyr	Leu	Thr	Leu	Asn	Thr	Glu	Ser	Thr	Arg	Ile	Met	Thr
			500					505					510		
Lys	Leu	Arg	Ala	Gln	Gln	Cys	Arg	Phe	Trp	Thr	Ser	Phe	Phe	Pro	Lys
		515					520					525			
Val	Leu	Glu	Met	Thr	Gly	Asn	Ile	Asp	Glu	Thr	Glu	Trp	Glu	Trp	Lys
	530					535					540				
Ala	Gly	Phe	His	Arg	Trp	Asn	Asn	Tyr	Met	Met	Asp	Trp	Lys	Asn	Gln
545					550					555					560
Phe	Asn	Asp	Tyr	Thr	Ser	Lys	Lys	Glu	Ser	Cys	Val	Gly	Leu		
				565					570						

<210> 21
 <211> 574
 <212> PRT
 <213> Equus caballus

<400> 21															
Glu	Glu	Asp	Ile	Ile	Ile	Thr	Thr	Lys	Asn	Gly	Lys	Val	Arg	Gly	Met
1				5					10					15	
Asn	Leu	Pro	Val	Leu	Gly	Gly	Thr	Val	Thr	Ala	Phe	Leu	Gly	Ile	Pro
			20					25					30		
Tyr	Ala	Gln	Pro	Pro	Leu	Gly	Arg	Leu	Arg	Phe	Lys	Lys	Pro	Gln	Ser
		35					40					45			
Leu	Thr	Lys	Trp	Ser	Asn	Ile	Trp	Asn	Ala	Thr	Lys	Tyr	Ala	Asn	Ser
	50					55					60				
Cys	Tyr	Gln	Asn	Thr	Asp	Gln	Ser	Phe	Pro	Gly	Phe	Leu	Gly	Ser	Glu
65					70					75					80
Met	Trp	Asn	Pro	Asn	Thr	Glu	Leu	Ser	Glu	Asp	Cys	Leu	Tyr	Leu	Asn
				85					90					95	
Val	Trp	Ile	Pro	Ala	Pro	Lys	Pro	Lys	Asn	Ala	Thr	Val	Met	Ile	Trp
			100					105					110		
Ile	Tyr	Gly	Gly	Gly	Phe	Gln	Thr	Gly	Thr	Ser	Ser	Leu	Pro	Val	Tyr
		115					120					125			
Asp	Gly	Lys	Phe	Leu	Ala	Arg	Val	Glu	Arg	Val	Ile	Val	Val	Ser	Met
	130					135					140				
Asn	Tyr	Arg	Val	Gly	Ala	Leu	Gly	Phe	Leu	Ala	Leu	Ser	Glu	Asn	Pro
145					150					155					160
Glu	Ala	Pro	Gly	Asn	Met	Gly	Leu	Phe	Asp	Gln	Gln	Leu	Ala	Leu	Gln
				165					170					175	
Trp	Val	Gln	Lys	Asn	Ile	Ala	Ala	Phe	Gly	Gly	Asn	Pro	Arg	Ser	Val
			180					185					190		
Thr	Leu	Phe	Gly	Glu	Ser	Ala	Gly	Ala	Ala	Ser	Val	Ser	Leu	His	Leu
		195					200					205			
Leu	Ser	Pro	Arg	Ser	Gln	Pro	Leu	Phe	Thr	Arg	Ala	Ile	Leu	Gln	Ser
	210					215					220				
Gly	Ser	Ser	Asn	Ala	Pro	Trp	Ala	Val	Thr	Ser	Leu	Tyr	Glu	Ala	Arg
225					230						235				240
Asn	Arg	Thr	Leu	Thr	Leu	Ala	Lys	Arg	Met	Gly	Cys	Ser	Arg	Asp	Asn

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<210> 22
<211> 574
<212> PRT
<213> Felis catus
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<400> 22
Glu Glu Asp Ile Ile Ile Thr Thr Lys Asn Gly Lys Val Arg Gly Met
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Asn Leu Pro Val Leu Asp Gly Thr Val Thr Ala Phe Leu Gly Ile Pro
20 25 30

Tyr	Ala	Gln	Pro	Pro	Leu	Gly	Arg	Leu	Arg	Phe	Lys	Lys	Pro	Gln	Phe
	35						40					45			
Leu	Thr	Lys	Trp	Ser	Asp	Ile	Trp	Asn	Ala	Thr	Lys	Tyr	Ala	Asn	Ser
	50					55					60				
Cys	Tyr	Gln	Asn	Ala	Asp	Gln	Ser	Phe	Pro	Gly	Phe	Pro	Gly	Ser	Glu
65					70					75					80
Met	Trp	Asn	Pro	Asn	Thr	Asp	Leu	Ser	Glu	Asp	Cys	Leu	Tyr	Leu	Asn
				85					90					95	
Val	Trp	Ile	Pro	Thr	Pro	Lys	Pro	Lys	Asn	Ala	Thr	Val	Met	Ile	Trp
			100						105					110	
Ile	Tyr	Gly	Gly	Gly	Phe	Gln	Thr	Gly	Thr	Ser	Ser	Leu	Pro	Val	Tyr
	115						120					125			
Asp	Gly	Lys	Phe	Leu	Ala	Arg	Val	Glu	Arg	Val	Ile	Val	Val	Ser	Met
	130					135					140				
Asn	Tyr	Arg	Val	Gly	Ala	Leu	Gly	Phe	Leu	Ala	Leu	Pro	Gly	Asn	Pro
145					150					155					160
Glu	Val	Pro	Gly	Asn	Met	Gly	Leu	Phe	Asp	Gln	Gln	Leu	Ala	Leu	Gln
				165					170					175	
Trp	Val	Gln	Lys	Asn	Ile	Ala	Ala	Phe	Gly	Gly	Asn	Pro	Lys	Ser	Val
			180					185						190	
Thr	Leu	Phe	Gly	Glu	Ser	Ala	Gly	Ala	Gly	Ser	Val	Ser	Leu	His	Leu
	195						200					205			
Leu	Ser	Pro	Arg	Ser	Gln	Pro	Leu	Phe	Thr	Arg	Ala	Ile	Leu	Gln	Ser
	210					215					220				
Gly	Ser	Ser	Asn	Ala	Pro	Trp	Ala	Val	Met	Ser	Leu	Asp	Glu	Ala	Lys
225					230					235					240
Asn	Arg	Thr	Leu	Thr	Leu	Ala	Lys	Phe	Ile	Gly	Cys	Ser	Lys	Glu	Asn
				245					250					255	
Asp	Thr	Glu	Ile	Ile	Lys	Cys	Leu	Arg	Asn	Lys	Asp	Pro	Gln	Glu	Ile
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Cys 65	Tyr	Gln	Asn	Ile	Asp	Gln	Ala 70	Phe	Pro	Gly	Phe	Gln	Gly	Ser	Glu
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